

[Nov. 30,

Trust Funds. 1894.*Scientific Relief Fund.*

£6,000 L. & N.W.R. 4 per Cent. Consolidated Guaranteed Stock.
 £7,200 Great Northern Railway 3 per Cent. Debenture Stock.
 £1,340 South Eastern Railway 5 per Cent. Debenture Stock.
 £509 10s. 7d. 2½ per Cent. Annuities.

<i>Dr.</i>	<i>£ s. d.</i>	<i>Cr.</i>
To Balance { Income.....		
Less Capital over-invested	862 16 5	By Grants
	571 19 7
Dividends	290 16 10	
" Interest on Deposit	665 0 7	
" Donations (Capital)	14 10	
" Balance, Capital over-invested	20 10 0	
Less Income in hand	351 9 7	
	546 6 10	
	5 2 9	
	4982 5 0	
	

Donation Fund.

£5,030 Great Northern Railway Perpetual 4 per Cent. Guaranteed Stock.
 The Trevelyan Bequest. £1,861 6s. 8d. Great Northern Railway 3 per Cent. Debenture Stock.

<i>Dr.</i>	<i>£ s. d.</i>	<i>Cr.</i>
To Balance	641 19 2	By Grants
" Dividends	249 5 7
" Transfer from Jodrell Fund	138 0 7	" Balance
	
	£1,029 5 4	
	

Rumford Fund.

£2,330 2*½* per Cent. Consolidated Stock.

	£	s.	d.
To Balance	223	7	7
,, Dividends	62	1	9
	<u>£225</u>	<u>9</u>	<u>4</u>
By Balance			
	<u>£285</u>	<u>9</u>	<u>4</u>

Bakerian and Coplen Medal Fund.

Consolidated Stock

The Keck Bequest.

£800 Midland Railway 3 per Cent. Debenture Stock.

	£	s.	d.
To Balance	4	3	7
, Dividends	23	5	6
	<u>£27</u>	<u>9</u>	<u>1</u>
By Payment to Foreign Secretary			
	<u>27</u>	<u>9</u>	<u>1</u>
	<u><u>£27</u></u>	<u><u>9</u></u>	<u><u>1</u></u>

[Nov. 30,

Winttingham Fund.£1,200 2*½* per Cent. Consolidated Stock.

	£ s. d.	£ s. d.
To Balance	38 7 4	By Payment to Foundling Hospital
" Dividends	31 19 10	38 7 4
	<hr/>	<hr/>
	£70 7 2	31 19 10
	<hr/>	<hr/>

Croonian Lecture Fund.

One-fifth of the clear rent of an Estate at Lambeth Hill, from the College of Physicians, about £52 per annum.

	£ s. d.	£ s. d.
To Balance	2 3 2	By Lecture (1894), Ramon y Cajal
Rent	50 7 6	50 0 0
" Balance	1 13 10	4 4 6
	<hr/>	<hr/>
	£54 4 6	£54 4 6
	<hr/>	<hr/>

Davy Medal Fund.

£660 Madras Railway Guaranteed 5 per Cent. Stock.

	£ s. d.	£ s. d.
To Balance	79 14 7	By Gold Medals
" Dividends	31 19 2	62 16 0
	<hr/>	<hr/>
	£111 13 9	48 17 9
	<hr/>	<hr/>

The Gassiot Trust.

£10,000 Italian Irrigation Bonds.

£400 $2\frac{3}{4}$ per Cent. Consolidated Stock.

	£ s. d.	£ s. d.
To Balance	190 16 8	By Payments to Kew Committee.....
" Dividends	495 0 9	" Purchase of Ten Italian Irrigation Bonds
" Ten Bonds drawn	234 14 4	" Balance
	<hr/> <hr/>	<hr/> <hr/>
	£920 11 9	£920 11 9
	<hr/> <hr/>	<hr/> <hr/>

Hanley Fund.

£4,798 Lancashire and Yorkshire Railway 4 per Cent. Guaranteed Stock.

	£ s. d.	£ s. d.
To Dividends	186 2 4	By Transfer to Catalogue Account
	<hr/> <hr/>	<hr/> <hr/>
	To Dividends	By Transfer to Catalogue Account
	<hr/> <hr/>	<hr/> <hr/>

The Jodrell Fund.

£5,182 14s. 10d. $2\frac{3}{4}$ per Cent. Consolidated Stock.

	£ s. d.	£ s. d.
To Dividends	138 0 7	By Transfer to Donation Fund
	<hr/> <hr/>	<hr/> <hr/>
	To Dividends	By Transfer to Donation Fund
	<hr/> <hr/>	<hr/> <hr/>

Fee Reduction Fund.

£4,900 Metropolitan 3 $\frac{1}{2}$ per Cent. Stock. (Converted from £7,000 4 per cent. Stock).

	£ s. d.	£ s. d.
To Balance	143 6 4	By Transfer to Royal Society General Account.....
" Dividends	435 19 7	" Purchase of £200 Metropolitan 3 $\frac{1}{2}$ per Cent. Stock.....
	<hr/> <hr/>	<hr/> <hr/>
	£679 5 11	" Balance
	<hr/> <hr/>	<hr/> <hr/>

[Nov. 30,

Darwin Medal Fund.

£2,200 South Eastern Railway 4 per Cent. Debenture Stock.

	£ s. d.	£ s. d.
To Balance	477 9 5	By Silver Medal
" Dividends	85 6 11	Gift: Sir J. D. Hooker
		" Balance
	£562 16 4	0 17 6
		£562 16 4

Joule Memorial Fund.

£1,000 London, Brighton, and South Coast Railway Consolidated Guaranteed 5 per Cent. Stock.
£50 on Deposit on behalf of the Committee.

	£ s. d.	£ s. d.
To Balance	97 1 9	By Purchase of £100 London, Brighton and South
" Interest on Deposit	1 6 7	Coast Consolidated Guaranteed 5 per Cent.
" Dividends	48 8 10	Stock
" Amount withdrawn from Deposit	100 0 0	" Balance
	£246 17 2	106 17 10
		79 19 4
		£246 17 2

Brady Library Fund.

	£ s. d.	£ s. d.
£311 19s. on Deposit Account at Bank.		By Balance on Deposit November 12th, 1894
	£311 19 0	311 19 0
To Amount on Deposit at Bank November 12th, 1893	307 8 6	
" Interest thereon	4 10 6	
	£311 19 0	£311 19 0

Gunning Fund.

£1,000 4 per Cent. Bond of His Excellency Dr. Gunning.

	£ s. d.	£ s. d.
To Balance	60 0 0	By Balance
," Interest	60 0 0	
	<u>£120 0 0</u>	<u>£120 0 0</u>
		<u>=====</u>

Buchanan Medal Fund.

£258 9s. 2d. Metropolitan 3 per Cent. Stock.

	£ s. d.	£ s. d.
To Cash, per Secretary of the Fund, Dr. Bristowe ...	276 12 0	By Purchase of £258 9s. 2d. Metropolitan 3 per
," Dividend	1 17 6	Cent. Stock
	<u>£278 9 6</u>	<u>276 12 0</u>
		<u>1 17 6</u>
		<u>£278 9 6</u>
		<u>=====</u>

Income and Expenditure Account from 12th November, 1893, to 12th November, 1894.

	RECEIPTS.			EXPENDITURE.		
To	£	s.	d.	£	s.	d.
Balance at Bank and in hand 12th November, 1893 :—		185	14	10		
General Purposes	2,200	0	0	By Salaries, and Wages.....	1,444	10
Catalogue Account	500	0	0	” Publications	3,259	2
Challenger Account	0	5	0	” Catalogue of Scientific Papers and Index :—		
Water Research Account		2,885	19	Withdrawn from Deposit	500	0
Composition and Admission Fees	70	0	0	Paid out of General Funds	254	5
Annual Contributions	1,414	0	0	Books for the Library	500	0
Rents	696	5	7	” Miscellaneous Expenses, Office, House, Receptions, &c.	754	5
” Dividends and Interest	2,596	10	7	” Water Research Payments	321	9
” Sale of Publications	678	0	1	Balance at Bank and in hand :—	1,446	7
” Water Research Grants	250	0	0	General Purposes	350	2
Receipts on Account of Catalogue	234	18	10	Catalogue Account	1,700	0
” Kew Committee Loan repaid	200	0	0	Challenger Account	500	0
” Proceeds of Sale of £722 14s. Id. India 3 per cent. Stock	724	9	2	Water Research Account	247	8
” Proceeds of Sale of £270 11s. 11d. 2½ per cent. Consolidated Stock..	274	18	9		2,797	11
						0
						£10,025
						2 10

The following Table shows the progress and present state of the Society with respect to the number of Fellows :—

	Patron and Royal.	Foreign.	Com- ounders.	£4 yearly.	£3 yearly.	Total.
Nov. 30, 1893 ..	5	48	153	124	181	511
Since Elected ..		+3		+1	+15	+19
Since Compounded ..			+1		-1	
Since Deceased ..	-1	-3	-4	-8	-4	-20
Withdrawn or Removed ..				-2		-2
Nov. 30, 1894 ..	4	48	150	115	191	508

Account of Grants from the Donation Fund in 1893-94.

	£	s.	d.
Prof. J. Milne, in further aid of his Seismographic Inves- tigations	100	0	0
Prof. Liveing, to enable Mr. W. J. Sell to continue certain Chemical Researches.....	25	0	0
W. T. Thiselton Dyer, to further aid Mr. Theodore Bent in making Botanical Collections in Southern Arabia ..	50	0	0
Measurement of Plants and Animals Committee (per F. Galton) for conducting Statistical Inquiries into the Measurable Characteristics of Plants and Animals....	50	0	0
Dr. H. Hicks, to enable Mr. J. Lewis Abbott to continue his Exploration of an Ossiferous Fissure near Ightham	10	0	0
Prof. G. H. Darwin, to assist him in his work on Periodic Orbits	30	0	0
Sir A. Geikie, to assist Miss M. M. Ogilvie in her Geo- logical Researches.....	50	0	0
Prof. J. B. Sanderson, to assist Mr. H. M. Vernon in his Physiological Researches	25	0	0
Prof. McKendrick, to further aid Dr. Jack in Researches on Muscular Movements.....	5	0	0
Prof. W. C. Williamson, in aid of his Researches on Fossil Plants	10	0	0
Capt. Abney, for aid in his Researches on Colour.....	40	0	0
Carried forward.....	£395	0	0
	F	2	

	£	s.	d.
Brought forward	395	0	0
Prof. W. M. Hicks, to aid him in his Experiments on the Higher Recalescence Point of Iron.....	20	0	0
Refunded Government Grant Committee (additions to Royal Society's telescope)	250	0	0
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	£665	0	0

“ Electrical Interference Phenomena somewhat analogous to Newton’s Rings, but exhibited by Waves along Wires.”
By EDWIN H. BARTON, B.Sc., late “ 1851 Exhibition ” Science Scholar. Communicated by Professor ARTHUR W. RÜCKER, M.A., F.R.S. Received February 20,—Read April 19,—Abbreviated* July, 1894.

INTRODUCTION.

The preliminary paper on this subject† gave the results of a single experiment, and approximately accounted for them by a mathematical theory of the reflexion and interference phenomena involved.

Since the publication of that paper the question of disturbances has been investigated, the experimental conditions improved, and various results obtained in confirmation of the original conclusions.

These matters form the subject of the present communication.

The apparatus employed for observing the interference phenomena is diagrammatically represented in fig. 1 and explained in the notes accompanying it.

In Experiment VII the electrometer was placed at HH' instead of EE', its usual position. In Experiments VIII and IX two electrometer needles were used, their respective attachments being at FF' and HH'.

The lengths of SAM and MD, and the special construction of the abnormal part will be specified as required in the course of the paper when reference is made to the figure.

In the former paper‡ it was shown that in the case of a train of electrical waves advancing along the secondary from AA' towards DD' fig. 1, we have the following phenomena:—

- (1.) A partial reflexion at BB', the beginning of the abnormal part;
- (2.) A partial reflexion at CC', the end of the abnormal part; and
- (3.) Interferences between the two sets of waves proceeding from BB' and CC' respectively.

* The references given in the abstract of this paper (‘ Proceedings,’ vol. 55, p. 350) are to the full manuscript, preserved in the archives of the Royal Society.

† ‘ Proc. Roy. Soc.,’ vol. 54, pp. 85—96.

‡ *Loc. cit.*, p. 87.